## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

## LISTING OF CLAIMS

1. (original) A sensor comprising: (a) a substrate; (b) at least one pair of electrodes; (c) an encapsulating matrix comprising; (d) at least one enzyme; (e) at least one reactant; and (f) at least one transducer material.

2. (original) The sensor of claim 1, wherein said substrate is selected from the group consisting of glass, ceramic, and plastic.

3. (original) The sensor of claim 1, wherein said electrodes comprise one or more elements selected from the group consisting of gold, platinum, or silver.

4. (original) The sensor of claim 1, wherein said electrodes are interdigitated.

5. (original) The sensor of claim 1, wherein said sol gel matrix covers the substrate and the electrodes.

6. (original) The sensor of claim 1, wherein said encapsulating matrix is a sol gel, said sol gel matrix comprising at least one organosilane, which may be tetrafunctional, like tetramethoxy orthosilicate, trifunctional, like methyltrimethoxysilane, octadecyltrichlorosilane, octadecyltriethoxysilane, phenyltrimethoxysilane and 1,4-

bis(trimethoxysilylethyl)benzene, or difunctional, like methyldimethoxysilane,

dimethyldiethoxysilane, or monofunctional, like octadecyldimethylmethoxysilane, or

derivatized silanes, like 2-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, 3-aminopropyl-

trimethoxsilyane, 4-aminobutyldimethoxysilane, N-(2-aminoethyl)-3-aminopropyl-

methyldimethoxysilane, 5-(bicycloheptenyl)triethoxysilane,

dicyclohexyldimethoxysilane and 3-glycidylpropyltrimethoxysilane.

7. (original) The sensor of claim 1, wherein said encapsulating matrix encapsulates

said enzyme.

8. (original) The sensor of claim 8, wherein said enzyme may be one selected from the

group consisting of tryptophanase, gelatinase, β-lactamase, catalase, casease, citrase,

decarboxylase, deoxyribonuclease, lipase, nitrate reductase, β-galactosidase,

cytochrome oxidase, phenylalanine deaminase, 1-pyrrolidonyl arylamidase, cystein

desulfase, urease, L-asparaginase, glutamate dehydrogenase, organphosphorus

hydrolase, acetylcholinesterase, α-amylase and is preferably glucose oxidase.

9. (original) The sensor of claim 1, wherein said transducer material and said reactant

are dispersed in said encapsulating matrix.

10. (original) The sensor of claim 1, wherein said reactant is starch containing amylose.

11. (original) The sensor of claim 1, wherein said transducer material is a polymer.

12. (original) The sensor of claim 11, wherein said polymer is a water soluble polymer.

13. (original) The sensor of claim 12, wherein said water-soluble polymer is selected from the group consisting of polyaniline, polythiophenes, polyacetylenes, polypyrroles, and combinations thereof.

14. (original) A method for the detection of organisms by a sensor, the sensor comprising a substrate; at least one electrode; a sol gel matrix comprising; at least one enzyme; at least one reactant; and at least one transducer material; wherein (a) an organism expresses an enzyme on the surface of the sensor; (b) the enzyme causes a reaction with the reactant of the sensor; (c) the product according to process step (b) reacts further as catalyzed by said enzyme of the sensor; (d) the products of process step (c) modulate at least one property of the transducer material; (e) the modulated property is measured.

15. (original) The method according to claim 14, wherein the expressed enzyme is selected from the group consisting of tryptophanase, gelatinase, β-lactamase, catalase, casease, citrase, decarboxylase, deoxyribonuclease, lipase, nitrate reductase, β-galactosidase, cytochrome oxidase, phenylalanine deaminase, 1-pyrrolidonyl arylamidase, cystein desulfase, urease, L-asparaginase, glutamate dehydrogenase, organphosphorus hydrolase, acetylcholinesterase, and α-amylase.

16. (original) The method of claim 14, wherein said product of process step (c) is selected from the group consisting of lactic acid, carbon dioxide, hydrogen, ethanol, acetic acid, succinic acid, gluconic acid, and formic acid.

17. (original) The method according to claim 14, wherein (a) an organism expresses $\alpha$-amylase; (b) $\alpha$-amylase catalyzes the hydrolysis of starch to form glucose; (c) glucose oxidation is catalyzed by glucose oxidase to form gluconic acid and $H_2O_2$; (d) gluconic acid and $H_2O_2$ modulate the electrical resistance of an inherently conductive polymer, or transducer material; (e) the modulated electrical resistance of the inherently conductive polymer, or transducer material is measured with a voltage source and ohmmeter.

18. (new)    The method of claim 14, wherein the sensor comprises at least one pair of electrodes.

19. (new)    The method of claim 14, wherein the substrate is selected from the group consisting of glass, ceramic, and plastic.

20. (new)    The method of claim 18, wherein said electrodes comprise one or more elements selected from the group consisting of polyaniline, polythiophenes, polyacetylenes, polypyrroles, and combinations thereof.

21. (new)    The method of claim 18, wherein said electrodes are interdigitated.

22. (new)    The method of claim 14, wherein said sol gel matrix covers the substrate and the electrodes.

23. (new)    The method of claim 14, wherein said sol gel matrix is an encapsulating sol gel, said encapsulating sol gel matrix comprising at least one organosilane, which

can be tetrafunctional, like tetramethoxy orthosilicate, trifunctional, like

methyltrimethoxysilane, octadecyltrichlorosilane, octadecyltriethoxysilane,

phenyltrimethoxysilane and 1,4-bis(trimethoxysilylethyl)benzene, or difunctional, like

methyldimethoxysilane, dimethyldiethoxysilane, or monofunctional, like

octadecyldimethylmethoxysilane, or derivatized silanes, like 2-(3,4-epoxycyclohexyl)-

ethyltrimethoxysilane, 3-aminopropyltrimethoxsilyane, 4-aminobutyldimethoxysilane,

N-(2-aminoethyl)-3-aminopropylmethyldimethoxysilane, 5-(bicycloheptenyl)-

triethoxysilane, dicyclohexyldimethoxysilane and 3-glycidylpropyltrimethoxysilane.

24. (new)     The method of claim 14, wherein said sol gel matrix encapsulates said at

least one enzyme.

25. (new)     The method of claim 14, wherein said at least one enzyme is selected from

the group consisting of tryptophanase, gelatinase, $\beta$-lactamase, catalase, casease,

citrase, decarboxylase, deoxyribonuclease, lipase, nitrate reductase, $\beta$-galactosidase,

cytochrome oxidase, phenylalanine deaminase, 1-pyrrolidonyl arylamidase, cystein

desulfase, urease, L-asparaginase, glutamate dehydrogenase, organphosphorus

hydrolase, acetylcholinesterase, $\alpha$-amylase and  is preferably glucose oxidase.

26. (new)     The method of claim 14, wherein said transducer material and said

reactant are dispersed in said sol gel matrix.

27. (new)     The method of claim 14, wherein said reactant is starch containing

amylose.

28. (new)    The method of claim 14, wherein said transducer material is a polymer.


29. (new)    The method of claim 28, wherein said polymer is a water soluble polymer.


30. (new)    The method of claim 29, wherein said water-soluble polymer is selected

from the group consisting of polyaniline, polythiophenes, polyacetylenes, polypyrroles,

and combinations thereof.